Claims:

1. An electrooptic device comprising:

a. an electrically conductive substrate having a surface s_1,

b. a movable membrane having a top surface and a bottom surface s_2, the movable membrane comprising a single crystal silicon layer,

c. a support for positioning the movable membrane at a first position spaced from said substrate by an air gap d_1 between surface s_1 and s_2, and

d. means for applying an electrical bias across the air gap to move the movable membrane from the first position to a second position having an air gap d_2.

2. The device of claim 1 wherein d_1 and d_2 define a range of air gaps and the means for applying an electrical bias moves the membrane continuously in the range.

3. The device of claim 2 wherein the range of air gaps is 1500 to 5000 Angstroms.

4. The device of claim 1 wherein the single crystal silicon layer has a thickness in the range 1000-5000 Angstroms.

5. The device of claim 4 wherein the SiO_2 layer has a thickness in the range 7000-15000 Angstroms.

6. The device of claim 1 wherein the conductive substrate is a semiconductor.

7. The device of claim 6 wherein the conductive substrate is silicon.

8. The device of claim 1 further including means for directing a beam of light onto the movable membrane.

9. The device of claim 8 wherein the beam of light has a wavelength of approximately 1550 nm.

10. A method for modulating light comprising:

a. directing a beam of light with a wavelength λ on a substrate,

b. providing a movable membrane spaced from said substrate, the movable membrane consisting of single crystal silicon,

c. providing a support for positioning said optically transparent portion of said membrane at a first position spaced from said substrate and defining an air gap d_1, and a second position spaced from said substrate defining an air gap d_2, and

d. applying an electrical bias across said air gap to move said optically transparent portion of said membrane from said first position to said second position.

11. The method of claim 10 wherein said substrate is silicon.

12. The method of claim 11 wherein λ is 1.55 μm.

13. A method for fabricating an electrooptic modulator comprising the steps of:

a. providing a substrate comprising:

i. a silicon substrate,

ii. an SiO_2 layer on the substrate,

iii. a single crystal silicon layer on the SiO_2 layer,

b. masking the single crystal layer with a mask having a central membrane feature and at least two arms extending from said central membrane feature to a peripheral frame, leaving exposed portions corresponding with spaces between said arms,

c. etching through the single crystal silicon layer etch using the mask as an etch mask to form openings corresponding with the spaces between the arms and expose portions of the SiO_2 layer in the openings, and

d. etching through the SiO_2 layer in the exposed portions and under the arms using a wet etchant, thereby forming an air gap between the substrate and the central membrane feature and leaving the central membrane feature supported by the arms.

14. A method for fabricating a multi-channel equalizer comprising the steps of:

a. providing a substrate comprising:

i. a silicon substrate,

ii. an SiO_2 layer on the substrate,

iii. a single crystal silicon layer on the SiO_2 layer,

b. masking the single crystal layer with a mask having a plurality of pairs of parallel elongated slots, each pair of parallel elongated slots defining an individual movable membrane,

c. etching through the single crystal silicon layer etch using the mask as an etch mask to form openings corresponding with the pairs of parallel elongated slots, and produce exposed regions of the SiO_2 layer,

d. etching the exposed regions of the SiO_2 layer to form slots in the SiO_2 layer corresponding to the slots in the single crystal silicon layer,

e. forming electrical contacts on the single crystal silicon layer between each pair of elongated parallel slots,

f. forming an electrical contact on the substrate,

g. etching the SiO_2 layer between the slots in the SiO_2 layer to remove the SiO_2 layer from beneath the plurality of elongated parallel slots in the single crystal silicon layer, and

h. providing electrical isolation around each individual membrane.

15. The device of claim 14 wherein the single crystal silicon layer has a thickness in the range 1000-5000 Angstroms.

16. The device of claim 14 wherein the SiO_2 layer has a thickness in the range 7000-15000 Angstroms.

17. The method of claim 14 wherein the etchant used in etch step d. is a wet etchant.